

UNITED STATES MARINE CORPS
Basic Officer Course
The Basic School
Marine Corps Combat Development Command
Quantico, Virginia 22134-5019

B8604

CASUALTY EVALUATION AND EVACUATION

Student Handout

1. **Introduction.** This handout and the accompanying lecture will teach you how to correctly diagnose injuries that are not immediately life-threatening, but could become so if not properly treated. You will also learn about the prioritizing of casualties and their evacuation.

2. **The Nine Diagnostic Signs.** A rapid but accurate examination of an injured or critically ill patient is essential for adequate emergency medical care. Such an examination includes observation of diagnostic signs and evaluation of symptoms. Signs are manifestations of changes in body functions, while symptoms are evidence of changes in body functions apparent to the patient and are determined by questioning. The following nine essential diagnostic signs can be observed rapidly during an examination:

a. **Pulse**

(1) The usual pulse rate in adults is 60-100 beats per minute; in children it is 80-100 beats per minute. The pulse can be palpated (felt by touch) at any area where an artery passes over a bony prominence or is close to the skin.

(2) The carotid artery in the neck is the best site to palpate the pulse. The pulse should always be checked with the patient lying down or sitting.

(3) Changes in the rate and volume of the pulse are important findings. The pulse rate is easily checked and reflects the rapidity of the heart contractions. The pulse volume describes the sensation the contraction itself gives to the palpating finger. Normally the pulse is a strong, easily felt impulse reflecting a full blood volume. A rapid, weak pulse can be the result of shock from loss of blood, while a rapid, bounding pulse is present in fright or hypertension. The absence of a pulse means that the specific artery is blocked or injured, that the heart has stopped functioning (cardiac arrest), or that death has occurred.

b. **Respiration**

(1) Usually respiration is between 12 and 20 breaths per minute, but well-trained athletes may breathe only six to eight times a minute. Rarely does the rate exceed 20 breaths per minute. Normal respiration is not usually shallow or deep. A record should be made of the initial rate and character of respiration when the casualty is first seen; any change should be recorded.

(2) Rapid, shallow respirations are seen in shock. Deep, gasping, labored breathing may indicate partial airway obstruction or pulmonary disease. In respiratory depression or respiratory arrest, there will be little or no movement of the chest and abdomen with respiration, and little air flow at the nose and mouth.

(3) Frothy sputum with blood at the nose and mouth accompanied by coughing indicates lung damage. Fractured ribs can tear the lungs; foreign bodies (e.g., bullets, knives) can penetrate and lacerate them. In each instance, bleeding within the lung may appear as coughed-up pink froth. Frothy pink or bloody sputum is also an indication of pulmonary edema, which can accompany acute cardiac failure or severe lung contusion.

c. **Blood pressure**

(1) Blood pressure is the pressure of the circulating blood against the walls of the arteries. Since in the normal person the arterial system is a closed system, changes in the pressure indicate changes in the volume of the blood, in the capacity of the vessels, or in the ability of the heart to pump. Changes in blood pressure, like those in the pulse, can be rapid. However, they are not as rapid as pulse changes because normal protective mechanisms exist to maintain blood pressure in spite of injury or disease.

(2) Blood pressure is determined with the use of a sphygmomanometer and stethoscope. Because specialized testing equipment must be used, the corpsman, not the Marine, will normally determine the blood pressure.

d. Temperature

(1) Normal body temperature is 98.6 degrees Fahrenheit (37.0 degrees Centigrade). The skin is largely responsible for regulation of this temperature by radiation of heat from blood vessels near the skin and the evaporation of water as sweat.

(2) Changes in temperature occur as a result of illness or injury. Cool, clammy (damp) skin is indicative of a general response to a trauma to the body (i.e., blood loss, shock, or heat exhaustion). As a result of nervous stimulation, sweat glands become hyperactive and skin blood vessels contract, resulting in cold, pale, wet, or clammy skin. These signs are often the first indication of shock, and they must be recognized as such. Exposure to cold will produce a cool, dry skin. Dry, hot skin may be caused by fever or by exposure to excessive heat, as in heatstroke.

(3) Temperature measurement by the use of a thermometer will not normally be practical for the Marine in the field. Placing the back of the hand on the victim's forehead to determine a "normal" temperature is all that can be expected.

e. Skin color

(1) Skin color depends primarily on the presence of circulating blood in subcutaneous blood vessels. In deeply pigmented people, skin color depends primarily on the pigment. Such pigment may hide true skin color changes resulting from illness or injury. In patients with deeply pigmented skin, color changes may be apparent in the fingernail beds, in the sclera, (white portion of the eye), or under the tongue. In lightly pigmented patients where changes may be seen more easily, colors of medical importance are red, white, and blue.

(a) A red color may be present in high blood pressure, certain stages of carbon monoxide poisoning, and heatstroke. The patient who has severe high blood pressure may sometimes be plethoric (the patient will have dark reddish- purple skin color and all visible blood vessels will be full). The patient with carbon monoxide poisoning is usually cherry red, as is the heatstroke patient.

(b) A pale, white, ashen, or grayish skin is indicative of insufficient circulation and is seen in patients who are in shock, are having an acute heart attack, or are in certain stages of fright. Here, there is literally not enough blood circulating in the skin.

(c) A bluish color, cyanosis, results from poor oxygenation of the circulating blood. As a result, blood is very dark and the overlying tissue appears blue. Cyanosis is caused by respiratory insufficiency due to airway obstruction or inadequate lung function. It is usually first seen in the fingertips and around the mouth. Cyanosis always indicates a significant lack of oxygen and demands rapid correction of the underlying respiratory problem.

(2) Chronic illness may also produce color changes such as the yellow color (jaundice) in liver disease. In such cases bilirubin, a reddish-yellow pigment normally present in the liver and the gastrointestinal tract, is deposited in the patient's skin.

f. Pupils

(1) The pupils, when normal, are regular in outline and usually the same size. In examination of the pupils the presence of contact lenses or prostheses (glass eyes) must be considered.

(2) Changes and variation in size of one or both pupils are important signs in emergency medical care. Constricted pupils are often present in a drug addict or a patient with a central nervous system disorder. Dilated pupils indicate a relaxed or unconscious state; such dilation usually occurs rapidly, within thirty seconds after cardiac arrest. Head injury or prior drug use, however, may cause the pupils to remain constricted even in patients with cardiac arrest.

(3) Variation in the size of the pupils is seen in patients with head injuries or strokes. In a small percentage of normal persons, anisocoria (unequal pupil size) is found. The incidence of this is so small, however, that in the casualty pupil variation is regarded as a reliable sign of brain damage. Ordinarily, pupils constrict promptly when light shines into the eye. This is a normal protective reaction of the eye. Failure of the pupils to constrict when a light shines into the eye occurs in disease, poisoning, drug overdose, and injury. In death, the pupils are widely dilated and fail to respond to light.

g. State of consciousness

(1) Normally, a person is alert, oriented (knows time, place, and what day it is), and responsive to vocal or physical stimuli. Any change from that state is indicative of illness or injury. Recording such a change is extremely important in emergency medical care. Such changes may vary from mild confusion in an alcoholic or mental patient to deep coma as a result of a head injury or poisoning. The state of consciousness of a patient is probably the single most reliable sign in assessing the status of the nervous system.

(2) It is extremely important to note the state of consciousness of a patient at once. All subsequent changes must be noted. Progressive development of coma or increasing difficulty in rousing a patient are signs that indicate an urgent need for prompt attention at the hospital. This is especially true in the patient who is unconscious following an injury, rouses and seems normal for a varying period of time (lucid interval), and then suddenly becomes unconscious and collapses. Such a patient has bleeding inside the skull and needs immediate surgery.

h. Ability to move

(1) The inability of a conscious patient to move voluntarily is known as paralysis. It may occur as a result of illness or injury. Paralysis of one side of the body (hemiplegia) may occur as a result of bleeding within the brain or a clot in a vessel (stroke). Some drugs, if used over long periods of time, may also cause paralysis.

(2) Inability to move the legs or arms after an accident should be interpreted as injury to the spinal cord until proved otherwise. Inability to move the legs while the arms remain normal indicates a spinal injury below the neck. Paralysis is a particularly important sign, and its presence and onset with regard to an injury must be recorded. The patient who has a completely severed spinal cord will be paralyzed below the level of the injury immediately and permanently. The patient who has a spinal injury in which gradual compression of the cord occurs experiences a progressive onset of paralysis.

i. Reaction to pain

(1) Reaction by vocal response or body movement to painful physical stimulation is a normal function of the body. Changes in this reaction may result from loss of sensation following an injury or illness.

(2) The loss of voluntary movement of the extremities after an injury is usually accompanied by loss of sensation in these extremities. Occasionally, however, movement is retained and the patient complains of numbness or tingling in the extremities. It is important that this fact be recognized as a sign of probable injury of the spinal cord so that mishandling does not occur and aggravate the condition.

(3) Severe pain in an extremity with loss of skin sensation may be the result of occlusion of the main artery of the extremity. In such a case the pulse in the extremity is absent. The ability to move the extremity is usually retained, although it is often held immobile because of pain.

(4) Frequently, patients suffering from hysteria, violent shock, or excessive drug or alcohol use may feel no pain from an injury for several hours. This is not accompanied by paralysis, and usually other signs will support a diagnosis of hysteria or other such reaction.

3. **Patient Assessment.** Upon arriving at the scene of an accident or combat injuries, the individual will learn much from quick, thorough observation. Sound judgement as to appropriate action can usually follow a good general survey.

4. **Primary Survey**

a. You should begin an initial survey of all patients on arrival. During the primary survey, you need only to talk, feel, and observe. No diagnostic equipment is needed. Inquiry should be brief and pertinent; no detailed questioning is necessary at this time. Four diagnostic signs (pulse, respiration, skin color, and state of consciousness) should be evaluated in the primary survey of each patient. This survey is intended to discover and correct any immediate life-threatening problems. All involved victims must be assessed initially, stopping only to treat the pulseless, nonbreathing patient, one with massive bleeding, or those in coma or shock.

b. During the primary survey, a definitive step-by-step outline of action must be followed. You must remain calm. This attitude will instill confidence in the patients and others as to your knowledge and ability to handle the situation. A record of initial observations can be started.

c. You should remember the primary assessment from Basic Life Support. Here are the steps to follow:

- (1) CHECK FOR CONSCIOUSNESS . . . "Are You O.K.?"
- (2) SHOUT . . . "HELP!!!"
- (3) POSITION THE VICTIM . . . On his/her back.
- (4) OPEN THE AIRWAY . . . Head tilt/chin lift method.
- (5) CHECK FOR BREATHLESSNESS . . . Look, listen, feel.

(6) GIVE TWO BREATHS.

(7) CHECK CAROTID PULSE.

5. Secondary Survey

a. Upon completion of the primary survey and control of any immediate life-threatening problems found, you must examine each patient more thoroughly in preparation for transportation to professional medical attention. A systematic head-to-toe general survey must be made to identify problems that must be cared for to prevent aggravation by movement to the ambulance or helicopter and subsequent transportation to a medical facility hospital.

b. A full secondary assessment can only be performed on a conscious victim. Here are the steps to follow (omit those that would not apply in the case of an unconscious victim).

(1) IDENTIFY YOURSELF TO THE VICTIM. Tell him/her that you know first aid and can help.

(2) TAKE VICTIM'S PULSE. Determine beats per minute. Write this information down if at all possible.

(3) COUNT VICTIM'S RESPIRATIONS. Determine breaths per minute.

(4) ASK VICTIM WHAT HAPPENED. Try to find out what the problem is, whether it has happened before, whether the patient is on medication, under the influence of drugs or alcohol, etc.

(5) EXAMINE PUPILS AND SKIN COLOR.

(6) CHECK VICTIM'S SKIN TEMPERATURE.

(7) EXAMINE VICTIM'S EARS, EYES, AND NOSE.

(8) BEGIN HEAD-TO-TOE EXAM. Start by gently feeling scalp, moving down to neck, collarbones, ribcage, abdominal area, arms, pelvic area, and finishing with legs.

(9) REMEMBER PERTINENT INFORMATION; TREAT INJURIES THAT YOU OBSERVED.

6. **Triage Procedures.** The actions previously described are for use with a single victim. Quite often, however, the unit leader will be faced with multiple victims. The leader must decide who will be treated and evacuated first, and who can wait. We call this triage. Triage is a French word meaning "picking, sorting, or choice" and is used to mean the sorting or allocation of patients according to a system of priorities. Triage is a continuing process and is the responsibility of the best trained individual at a disaster.

a. It is the responsibility of the Marine who first arrives on the scene to begin a screening process and, as soon as or before this action has been taken, to contact the field medical unit for additional equipment and personnel needed.

b. Prioritization. Patients with certain conditions or injuries have a priority for treatment and transportation over others.

(1) Priority "URGENT" must be treated first at the scene and transported immediately. Injuries/problems would include the following:

(a) Airway and breathing difficulties

(b) Cardiac arrest

(c) Uncontrolled or suspected severe hidden bleeding

(d) Open chest or abdominal wounds

(e) Severe head injuries with evidence of brain damage, however slight

(f) Several medical problems: poisonings, diabetes with complications, cardiac disease with failure

(2) Priority "PRIORITY": transportation and hospital treatment can be delayed. The following are typical problems or injuries:

- (a) Burns without complications
- (b) Major or multiple fractures
- (c) Back injuries with or without spinal damage

(3) Priority "ROUTINE": these are transported or treated last.

- (a) Minor fractures or other injuries of a minor nature
- (b) Obviously mortal wounds where death appears reasonably certain
- (c) Obviously dead

c. It becomes apparent that the philosophy of emergency medical care must change in a disaster with mass casualties. Time spent on one elderly patient with severe injuries will deprive a number of younger patients with less severe but dangerous injuries of the emergency medical care necessary for survival.

d. A separate category of triage should also be noted, as it supersedes all others. Patients who have suffered radiation contamination and are themselves carrying radiating particles must be segregated immediately as an initial step. They must not be allowed to contaminate other patients, ambulances, or the hospital.

e. Leadership is paramount during triage. Someone must be in command to guide what is being done and to utilize any help as it arrives. This is the duty of the most highly trained Marine or the corpsman. The Marine must establish priorities and, depending on the availability of transport vehicles and local conditions, determine how the patients will be managed.

7. **Preparation for Evacuation.** Once victim assessments have been completed, preparations must be made for transporting a victim to medical care. Normally, in the civilian community, victims are rarely (if ever) moved by first responders. In these cases, the rule of thumb is "do not move the victim unless in imminent danger." But in a tactical or combat scenario, most victims will require movement to reach a MEDEVAC helicopter or ambulance. This means that identification and treatment of fractures, spinal injuries, and other injuries are crucial. Proper immobilization or splinting of a fracture is the simplest procedure in evacuation.

a. Fractures. A fracture is any break in the continuity of a bone. Although fractures can cause total disability and in some cases death, they can most often be treated so there is complete recovery. Rapid recovery is dependent on proper and immediate first aid. First aid includes immobilization of the fractured part in addition to the application of appropriate lifesaving measures. A basic splinting principle is to immobilize the joint above and below any fracture.

(1) Kinds of Fractures

(a) Closed fracture. A closed fracture is a break in the bone without a break in the overlying skin. In a closed fracture there may be tissue damage beneath the skin. Even though an injury may be a dislocation or sprain, it should be considered as a closed fracture for purposes of applying first aid.

(b) Open fracture. An open fracture is a break in the bone as well as in the overlying skin. The broken bone may have come through the skin, or a missile such as a bullet or shell fragment may have gone through the flesh to the bone. An open fracture is contaminated and is subject to infection.

(2) Symptoms of fractures. Other than the obvious protrusion of a bone through the skin, indications of a fracture are tenderness or pain when slight pressure is applied to the injured part and swelling as well as discoloration of the skin at the injury site. Sharp pain when the individual attempts to move the part is also a sign of a fracture. There may be deformity of an extremity, and a grating sound may be heard when the broken bone ends rub together. If you are not sure whether or not a bone is fractured, treat the injury as a fracture.

(3) Splinting. A body part that contains a fracture must be immobilized to prevent the sharp edges of the bone from moving and cutting tissue, muscle, blood vessels, and nerves. Immobilization also reduces pain and helps to prevent or control shock. In a closed fracture, immobilization keeps bone fragments from causing an open wound, thereby preventing contamination and possible infection. Immobilization is accomplished by splinting.

(a) Rules for splinting

1 _____ IF THE FRACTURE IS OPEN, STOP THE BLEEDING.

2 _____ REMOVE ALL BINDING OBJECTS.

3 _____ APPLY THE PROVEN PRINCIPLE "splint them where they lie." This means that if the situation permits, splint the fractured part before any movement of the casualty is attempted and without any change in the position of the fractured part. If a bone is in an unnatural position do not try to straighten it. If circumstances make it essential to move a casualty with a fracture of a lower extremity before a splint can be applied, use the uninjured leg as a splint by tying the fractured one to it; grasp the casualty beneath the armpits and pull him in a straight line only; do not roll him or move him sideways.

4 _____ IMMOBILIZE THE JOINT ABOVE AND BELOW THE BREAK.

5 _____ USE PADDING BETWEEN THE INJURED PART AND THE SPLINT to prevent undue pressure and further injury to tissue, blood vessels, and nerves. This is especially important in the area between the legs, the armpit, and on places where the splint comes in contact with bony parts such as the elbow, wrist, knee, or ankle joint.

6 _____ BIND THE SPLINT WITH BANDAGES at several points above and below the fracture, but do not bind so tightly that it interferes with the flow of blood. No bandage should be applied across the fracture. Tie bandages so that the knots are against the splint, and tie them with a nonslip knot.

7 _____ USE A SLING to support a splinted arm which is bent at the elbow, a fractured elbow which is bent, a sprained arm, or an arm with a painful wound.

8 _____ CHECK FOR BLOOD CIRCULATION below the injury site both before and after splinting.

b. Spinal injury. Dealing properly with spinal injuries before evacuation of a victim is supremely important.

(1) Symptoms. The second problem to deal with in preparation for evacuation is the possibility of spinal injuries. Symptoms are discussed below.

(a) Pain. A patient who is conscious will be aware of pain and will be able to direct attention to the area of injury in the back or neck. If the patient is unconscious, this most important and reliable symptom is not available. Occasionally, a conscious patient will not complain of pain in the area of a spinal fracture. This finding is especially true if the patient is lying very still and in a position of relative comfort, or if more painful injuries are distracting attention from the spinal fracture. In this situation, the next two symptoms will be useful.

(b) Numbness, tingling, or weakness. If the conscious patient has lost feeling or muscle function, or if the patient has tingling in the extremities, there is probably spinal cord damage.

(c) Painful movement. If the patient attempts to move the injured area of the spine, pain may increase significantly. Never try to test this increase in pain by moving the patient. Do not encourage anyone with neck or back pain to move. Proceed immediately to splinting.

(d) Deformity. Only rarely and with very severe injuries can a deformity of the spine be seen. The spine usually does not appear to be bent. Absence of deformity in no way rules out the possibility of fracture or dislocation of the spine. With or without this indication, the unconscious patient who has been involved in a fall or vehicle accident should be handled as a patient with a spinal injury.

(e) Lacerations and contusions. Cuts and bruises are reliable signs that strong forces have been applied to the patient's body. Almost all spinal fractures or dislocations, including those resulting from diving accidents, will be accompanied by a cut or bruise on the head or face. Patients with serious injuries in other areas of the spine are likely to have bruises over the shoulders, the back, or the abdomen. However, even if there are no cuts or bruises, a spinal fracture or dislocation cannot be ruled out.

(f) Paralysis and anesthesia. Any demonstrable weakness or loss of sensation should be considered a sign of spinal injury. Touch the patient's fingers, toes, arms, and legs. Muscle function can be tested by judging the strength of the grip and by asking the patient to move the feet up and down. Any loss of sensation or weakness must be managed as a spinal cord injury.

(g) Spinal cord injuries in the neck may cause numbness or paralysis of all four extremities as well as impaired breathing. Spinal fractures at the level of the waist may cause numbness or paralysis below the waist, but the

breathing function and the arms will not be affected.

(2) Looking for signs and symptoms. You can follow a simple series of steps for checking symptoms and signs of spinal fractures or dislocations in conscious patients.

(a) ASK the patient or witness about the accident; get details. Question the patient carefully about areas of pain, numbness, or weakness.

(b) LOOK for contusions or abrasions about the face and head or a deformity of the spine.

(c) FEEL for any irregularity, deformity, or tenderness along the spine that may indicate a fracture or dislocation. Check the arms and legs for numbness.

(d) HAVE THE VICTIM MOVE THE FINGERS AND TOES, unassisted, to check for paralysis.

(e) If any one of these signs or symptoms is positive, spinal injury must be suspected and appropriate splinting undertaken.

(3) Follow this order of evaluation with unconscious victims:

(a) Ask others at the scene of the accident.

(b) Look at the victim.

(c) Feel the victim's spine.

(d) If unconsciousness has resulted from an accident that would obviously cause spinal injury, for example, a vehicular or diving accident, assume that the patient has an associated spinal fracture until proven otherwise.

(4) Care of spinal injuries. The individual administering first aid promptly and properly has the opportunity to prevent paralysis and even death. The emergency care of spinal injuries follows the same rules as the emergency care for all other major injuries:

(a) RESTORE THE AIRWAY; be sure that breathing is satisfactory.

(b) CONTROL SERIOUS BLEEDING by local pressure dressings.

(c) Most important, SPLINT THE PATIENT BEFORE MOVING.

(d) Effective splinting markedly relieves the patient's pain and stabilizes the injured spine so that spinal cord damage from the movement of body fragments is much less likely.

(e) When splinting an injured spine, avoid abnormal or excessive motion. Be sure that the injured person is transported on a long backboard, without bending or twisting the spine in any direction. If the head of an individual with a spinal fracture is allowed to move, any single motion may cause paralysis or death.

c. Injuries of the skull and brain. These injuries must be dealt with prior to evacuation. A head injury may be isolated, or it may be a part of massive multiple trauma. For recovery and satisfactory return of normal function, proper treatment is vital as a first step, especially if the patient is unconscious. Care must start at the scene of the accident and should be maintained while the patient is promptly transported to the medical unit.

(1) Specific head injuries

(a) Scalp lacerations. Scalp injuries may be minor or very extensive. Emergency medical care is local control of the bleeding by a sterile dressing over the wound and a soft, self-adhering, circumferential roller bandage for compression. The bleeding site is thus effectively compressed against the skull. Usually the skull is stable enough to support compression sufficient to control both arterial and venous bleeding.

(b) Skull fractures. Skull fractures do not necessarily indicate brain damage. In fact, brain injury may be much more serious when there is no skull fracture and perhaps no external evidence of injury at all.

1 The diagnosis of a skull fracture is usually made at a hospital by x-ray

examination, but you may conclude there is a fracture if the patient's head appears deformed. If the scalp has been lacerated, there may even be a visible crack in the skull. Injuries from bullets or fragmentation weapons almost always result in fractures.

2 Emergency medical care of skull fractures consists of:

- a Controlling and maintaining an airway.
- b Controlling any bleeding from the edges of the wound.
- c Covering open wound properly.
- d Splinting the possibly injured spine.
- e Periodically monitoring and recording vital signs, pupil size, and level

of consciousness.

d. Injuries of the face and throat. Accidents often cause soft tissue injuries of the scalp, face, and neck in addition to fractures of the bones of the face and the jaw. These injuries may vary greatly in severity; some may be potentially life-threatening. Considering the potential for airway blockage, these injuries must be considered carefully prior to evacuation. When taking care of a person with a head or facial injury, it is important to remember that a cervical fracture may also have been sustained in the same accident. In this instance, treatment for the spinal injury must be combined with the procedures to be discussed.

(1) Breathing problems and hemorrhage are common in injuries of the head and face. The usual causes for these problems are as follows:

- (a) The upper airway may be obstructed by blood clots or loose teeth in the throat.
- (b) The upper airway may be obstructed because injuries of the mouth and nose or fractures of the lower jaw cause significant deformity.
- (c) The upper airway may be obstructed because of swelling resulting from soft tissue injury.
- (d) The position of the patient's head may cause the airway to be obstructed. When the neck is flexed, the jaw and tongue drop backward, blocking the airway.
- (e) The larynx or trachea may be injured, causing obstruction.
- (f) Brain damage from a blunt injury may interfere with the breathing mechanism.
- (g) The head and face receive the most ample blood supply in the body. Severe soft tissue injuries in these regions are invariably attended with profuse bleeding.

(2) Injuries of the face

(a) Soft tissue wounds. Soft tissue injuries of the face and scalp are common. Abrasions of the skin cause no serious problems. Contusions usually cause some swelling; some contusions of the scalp produce a local collection of blood, a hematoma, which looks and feels like a lump. Laceration and avulsion injuries are especially common. Avulsions of the scalp may be often seen, since any sharp blow may separate the scalp from the skull beneath. Well supplied with arteries and veins, the face and scalp usually bleed copiously from soft tissue wounds.

(b) Emergency care of soft tissue injuries of the face and scalp is identical to the treatment of soft tissue injuries elsewhere on the body. Control bleeding by local pressure. Remember, though, that you cannot splint fractures in this area to help control bleeding; so be careful not to apply too much pressure on the scalp if a skull fracture is suspected.

1 Apply a dressing that will help control the bleeding. A compression bandage placed around the head above the eyes will control bleeding from forehead and scalp. A compression bandage applied with insufficient pressure to control bleeding, however, may actually aggravate the hemorrhage if venous outflow is occluded and arterial inflow is not stopped.

2 When brain tissue or other deep structures are exposed, cover them with a sterile bandage and keep it moist so they will not dry and sustain secondary damage.

3 The local application of a cold compress may aid in controlling the swelling of

bruised soft tissues.

4 The dressing can be held by a bandage or by hand. When a laceration extends through the cheek directly into the mouth, it may be necessary to hold gauze padding against both the inside and the outside of the cheek. Objects penetrating the cheek usually must be removed before it is possible to control the bleeding.

(c) Check for bleeding inside the mouth. Broken teeth and lacerations of the tongue may cause profuse bleeding in the mouth, but the blood may in large part be swallowed, so that this hemorrhage is not apparent outside the mouth. This source of bleeding may have to be specifically sought and identified.

8. **Transportation of Casualties.** Transportation of the sick and wounded is normally the responsibility of medical personnel. When the situation is urgent and you are unable to obtain medical assistance or know that no medical evacuation facilities are available, you will have to transport the casualty.

a. Transporting a casualty by litter is safer and more comfortable for him/her than by manual means; it is also easier for you. Manual transportation, however, may be the only feasible method because of the terrain or the combat situation.

(1) Review pages 819 through 821 of your copy of FMFRP 4-52, First Aid, for explanations and examples of field expedient litters.

(2) Remember and practice these techniques.

b. Casualties carried by manual means must be carefully and correctly handled, otherwise their injuries may become more serious or possibly fatal.

(1) Review pages 81 through 819 of your copy of FMFRP 4-52, First Aid, for explanations and examples of manual carries.

(2) Remember and practice these techniques.

9. **Conclusion.** Remember the information presented here and in the corresponding lecture, and use it to train your Marines. Proper recognition, treatment, and evacuation of casualties will save lives.

QUESTIONS:

1. Deep, gasping, labored breathing indicates _____ or _____.
2. The average Marine's respiration is ____ to ____ times per minute.
3. The pulse is a prime indicator of _____.
4. A rapid, weak pulse is an indicator of _____.
5. The pulse is best taken at the _____.
6. Hot, dry skin indicates _____.
7. Match the observation with the indication.

ObservationIndication

Hot, dry: _____

a. Body is overheated

Cool, clammy: _____

b. Shock

8. Changes in skin color reflect an increase or decrease in the _____.
9. Blue/gray skin indicates _____.
10. Matching quiz (There may be more than one answer)

Shock _____

a. Deep, gasping respiration

Head injury _____

b. Bright red, frothy blood

Exposure to cold _____

c. No respiration

Cardiac arrest _____

d. No pulse

Cyanosis _____

e. Rapid, weak pulse

High blood pressure _____

f. Hot, dry skin

Excessive body heat _____

g. Cool, clammy skin

Airway obstruction _____

h. Cool, dry skin

Lung damage _____

i. Red skin

j. White skin

k. Blue skin

l. Dilated pupils

m. Pupils unequal in size

11. Triage is

12. Match the list of injuries with the appropriate category:

- a. Urgent b. Priority c. Routine

Dead	_____	Severe shock
Open chest wound	_____	A very large spear through the heart
cardiac arrest	_____	A large 3rd degree burn on the left leg
Two broken legs	_____	Numerous minor shrapnel wounds in both legs
A scraped knee		

13. Fractures are either _____ or _____.

14. An _____ fracture has exposed bone ends and resultant damage to tissue.

15. List the symptoms of fractures:

- a.
- b.
- c.
- d.
- e.

16. Name three items that can be used as splints:

- a.
- b.
- c.

17. The area of the fracture is padded to prevent _____ and _____.

18. A properly applied splint accomplishes the following:

- a. _____ c.
- b. _____ d.

19. If a rifle is used as a splint, be sure that it is _____.

20. All suspected spinal injuries should be _____.

21. The symptoms of a spinal cord injury include:

- a.
- b.
- c.
- d.

22. If the casualty can move his fingers and arms to a limited degree and with pain, there may be _____.

23. Emergency care procedures for spinal cord injuries take priority over all other types of injuries except:

a. _____ b.

24. What are the three principles of emergency care for spinal cord injuries?

a.

b.

c.

25. When moving a casualty with a spinal column injury onto a stiff stretcher, you must not change the of the spine.

26. What is the primary consideration when dealing with a face or throat injury?

_____.

ANSWERS:

1. Deep, gasping, labored breathing indicates an airway obstruction or heart failure.
2. The average Marine's respiration is 12 to 20 times per minute.
3. The pulse is a prime indicator of heart action.
4. A rapid, weak pulse is an indicator of shock.
5. The pulse is best taken at the carotid artery.
6. Hot, dry skin indicates excessive body heat.
7. Match the observation with the indication.

Observation

Hot, dry:

A

Cool, clammy:

B(Skin) Indication

8. Changes in skin color reflect an increase or decrease in the blood flow.
9. Blue/gray skin indicates poor oxygen content in blood.
10. Matching quiz (There may be more than one answer)

Shock

e, g, j

a. Deep, gasping respiration

Head injury

m

b. Bright red, frothy blood

Exposure to cold

h

c. No respiration

Cardiac arrest

c, d, l

d. No pulse

Cyanosis

k

e. Rapid, weak pulse

High blood

i

f. Hot, dry skin

pressure

Excessive body

f

g. Cool, clammy skin

heat

Airway obstruction a

h. Cool, dry skin

Lung damage

b i. Red skin

j. White skin

k. Blue skin

l. Dilated pupils

m. Pupils unequal in size

11. Triage is the sorting of casualties according to the severity of their injuries.
12. Match the list of injuries with the appropriate category:
a. Urgent b. Priority c. Routine

Dead

c

Severe shock

aOpen chest wound a

A very large spear through the heart

c

Cardiac arrest

a

A large 3rd degree burn on the left leg

b

Two broken legs

bNumerous minor shrapnel wounds in both legs b

A scraped knee

c

13. Fractures are either opened or closed.
14. An open fracture has exposed bone ends and resultant damage to tissue.
15. List the symptoms of fractures:
a. Exposed bone ends
b. Deformity

- c. Pain or tenderness
 - d. Grating
 - e. Swelling and discoloration
16. Name three items that can be used as splints:
- a. Rifle
 - b. Tree limbs
 - c. Chest wall
17. The area of the fracture is padded to prevent undue pressure and further injury.
18. A properly applied splint accomplishes the following:
- a. Reduces the probability of a closed fracture becoming an open fracture.
 - b. Minimized damage
 - c. Prevents bone ends from causing more bleeding
 - d. Reduces the pain
19. If a rifle is used as a splint, be sure that it is unloaded.
20. All suspected spinal injuries should be treated as actual fractures.
21. The symptoms of a spinal cord injury include:
- a. Pain and tenderness
 - b. Deformity
 - c. Cuts and bruises
 - d. Paralysis
22. If the casualty can move his fingers and arms to a limited degree and with pain, there may be pressure on the spinal cord.
23. Emergency care procedures for spinal cord injuries take priority over all other types of injuries except:
- a. Resuscitation (breathing)
 - b. Uncontrolled bleeding
24. What are the three principles of emergency care for spinal cord injuries?
- a. Assure adequate breathing
 - b. Make a complete body survey
 - c. Immobilize before moving
25. When moving a casualty with a spinal column injury onto a stiff stretcher, you must not change the relative position of the spine.
26. What is the primary consideration when dealing with a face or throat injury? Control the bleeding.